withdrawn with the drive and control shafts.

In some instances, the catheter 22 may be a dual lumen catheter having a first lumen 136 containing the described anchor mechanism and a second lumen 138 containing an implant able medical device 140 to be anchored by the anchor 120. In this case, a tether 142 is connected between the anchor and the implant able medical device, and once the anchor is in place, the implant able medical device is ejected from the catheter.

When it is possible to use the catheter to properly position the anchor 120 relative to a body wall, the tube 124 and tube retention sleeve126 can be eliminated and replaced by the catheter lumen. Now the drive shaft 50 will drive the shaft support hub 130 longitudinally to drive the anchor from the catheter lumen and through the body wall.

We claim:

1. A medical device anchor for penetration through a body wall from a first side to a second side thereof and expansion against said second side comprising:

an anchor shaft having a proximal end and a distal end,

an expandable anchor at the distal end of said anchor shaft having one or more anchor sections, said expandable anchor having a first collapsed configuration wherein said anchor is substantially coextensive with said anchor shaft and a second expanded configuration wherein said one or more anchor sections extend outwardly from said anchor shaft in at least two opposed directions.

2. The medical device anchor of claim 1 wherein said expandable anchor includes a pointed lead end.

3. The medical device anchor of claim 1 wherein said expandable anchor is configured to extend outwardly from said anchor shaft in a spiral configuration in the second expanded configuration of said expandable anchor.

4. The medical device anchor of claim 1 wherein the expandable anchor at the distal end of said anchor shaft is formed integrally with said anchor shaft by splitting said anchor shaft longitudinally at the distal end thereof to form first and second anchor sections.

5.The medical device anchor of claim 4 wherein said anchor shaft has a longitudinal axis, and wherein said first and second anchor sections expand outwardly from said anchor shaft in opposite directions and transverse to the longitudinal axis of said anchor shaft in the second expanded configuration of said expandable anchor.

6. The medical device anchor of claim 5 wherein said first and second anchor sections curve arcuately outward from said anchor shaft and back toward said anchor shaft in the

second expanded configuration of said expandable anchor.

7. The medical device anchor of claim 3 wherein said expandable anchor is formed of shape memory material which is compliable and compressible in a first state and which is self-expandable in a second state to a substantially rigid, predetermined spiral configuration.

8 The medical device anchor of claim 5 wherein said expandable anchor is formed of shape memory material which is compliable and compressible in a first state and which is self-expandable in a second state to a substantially rigid, predetermined configuration in which said first and second anchor sections extend outwardly from said anchor shaft in opposite directions.

9 The medical device anchor of claim 1 wherein the proximal end of said anchor shaft is connected to a shaft support hub, said shaft support hub having a connector for receiving a drive shaft.

10. A medical device anchor and delivery system for propelling an anchor through a body wall from a first side to a second side where said anchor expands against said second side comprising:

an anchor shaft having a proximal end and a distal end,

an expandable anchor at the distal end of said anchor shaft having one or more anchor sections, said expandable anchor having a first collapsed configuration wherein said anchor is substantially coextensive with said anchor shaft and a second expanded configuration wherein said one or more anchor sections extend outwardly from said anchor shaft in at least two opposed directions,

a shaft support hub connected to the proximal end of said anchor shaft,

an elongate tube having an entry end and an exit end, said tube containing said anchor shaft with said expandable anchor in said collapsed configuration adjacent to said exit end, and

a drive shaft having a first end in engagement with said shaft support hub and operative when propelled to cause said shaft support hub to move said anchor shaft longitudinally of said elongate tube to propel said expandable anchor outwardly from the exit end of said tube.

11. The medical device anchor and delivery system of claim 10 wherein said drive shaft includes a second end opposite to said first end, said second end being connected to a propulsion unit operative to propel said drive shaft.

12. The medical device anchor and delivery system of claim 10 wherein the entry end of

said elongate tube is connected to a tube retention sleeve, said anchor shaft extending outwardly from the entry end of said elongate tube to said shaft support hub spaced from said tube retention sleeve when said expandable anchor is in said collapsed configuration within said elongate tube,

said drive shaft operating when propelled to move said shaft support hub toward said tube retention sleeve.

13. The medical device anchor and delivery system of claim 11 wherein the expandable anchor at the distal end of said anchor shaft is formed integrally with said anchor shaft by splitting said anchor shaft longitudinally at the distal end thereof to form first and second anchor sections.

14 The medical device anchor and delivery system of claim 13 wherein said anchor shaft has a longitudinal axis and wherein said first and second anchor sections expand outwardly from said anchor shaft in opposite directions and transverse to the longitudinal axis of said anchor shaft in the second expanded configuration of said expandable anchor.

15. The medical device anchor and delivery system of claim 14 wherein said expandable anchor includes a pointed lead end.

16. The medical device anchor and delivery system of claim 14 wherein said first and second anchor sections curve arcuately outward from said anchor shaft and back toward said anchor shaft in the second expanded configuration of said expandable anchor.

17. The medical device anchor and delivery system of claim 14 wherein said expandable anchor is formed of thermal shape memory material having a temperature transformation level where at temperatures below said temperature transformation level said shape memory material is relatively pliable and compressible and at temperatures at least at or above said temperature transformation level said shape memory materialis self-expandable to a substantially rigid predetermined configuration.

18. A blood clot filter with an anchor delivery system for propelling one or more anchors through the wall of a blood vessel from a first inner side to a second outer side, the blood clot filter having a central longitudinal axis and being collapsible to a collapsed configuration toward said longitudinal axis and expandable in an expanded configuration outwardly from said longitudinal axis for contact with said inner side of the wall of said blood vessel,said blood clot filter with anchor delivery system comprising:

a plurality of elongate, spaced legs each having a distal end and a proximal end, the proximal ends of said elongate legs being secured together adjacent to the longitudinal axis of said blood clot filter, said plurality of elongate spaced legs being formed to extend outwardly away from said longitudinal axis to bring the distal ends thereof into contact with the first inner side of a blood vessel in the expanded configuration of said blood clot filter, one or more of said elongate spaced legs being tubular in configuration with an open

distal and an open proximal end,

an elongate anchor shaft mounted for longitudinal movement in each of said tubular elongate legs, each said elongate anchor shaft having first and second opposed ends,

an expandable anchor at the second end of each of said anchor shafts, said expandable anchor having one or more anchor sections with a first collapsed configuration wherein said anchor is substantially coextensive with said anchor shaft and a second expanded configuration wherein said one or more anchor sections extend outwardly from said anchor shaft in at least two opposed directions,

said tubular elongate legs each containing said expandable anchor in the first collapsed condition adjacent to the open distal end thereof, and

a shaft support hub connected to the first end of each elongate anchor shaft, said shaft support hub being spaced from the proximal ends of said elongate legs when an expandable anchor in the first collapsed condition is contained in said tubular elongate legs, said shaft support hub being movable toward said proximal ends of said elongate legs to move said anchor shafts longitudinally to propel said expandable anchors out from the open distal ends of said tubular elongate legs and through the wall of a blood vessel.

19. The blood clot filter with anchor delivery system of claim 18 wherein each said expandable anchor includes first and second anchor sections which expand outwardly from said anchor shaft in opposite directions when said expandable anchor is propelled out from the open distal end of a tubular elongate leg and through the wall of a blood vessel, said expandable anchor being oriented such that the first and second anchor sections expand in directions transverse to the longitudinal axis of said blood clot filter.

20. The blood clot filter with anchor delivery system of claim 18 which includes a drive shaft having a first drive shaft end connected to said shaft support hub to move said shaft support hub relative to the proximal ends of said elongate legs.

21. The blood clot filter with anchor delivery system of claim 20 wherein said drive shaft is mounted for movement within an elongate filter centering shaft having an inner end spaced adjacent to said shaft support hub, said filter centering shaft having a plurality of elongate, spaced, centering arms secured at one end to said centering shaft inner end, said centering armd being adapted to expand outwardly into engagement with said blood vessel wall inner side.

22. The blood clot filter with anchor delivery system of claim 21 wherein said drive shaft includes a second drive shaft end opposite to said first drive shaft end, said second drive shaft end being connected to a propulsion device to cause said drive shaft to propell said shaft support hub toward the proximal ends of said elongate legs.

23. The blood clot filter with anchor delivery system of claim 18 wherein said expandable

anchor is configured to extend outwardly from said anchor shaft in a spiral configuration in the second expanded configuration of said anchor.

24. The blood clot filter with anchor delivery system of claim 18 wherein the expandable anchor at the second end of each anchor shaft is formed integrally with the anchor shaft by splitting the anchor shaft longitudinally at the second end thereof to form first and second anchor sections.

25. The blood clot filter with anchor delivery system of claim 24 wherein said anchor shaft has a longitudinal axis, and wherein said first and second anchor sections expand outwardly from said anchor shaft in opposite directions and transverse to the longitudinal axis of said anchor shaft in the second expanded configuration of said expandable anchor.

26. The blood clot filter with anchor delivery system of claim 25 wherein each said expandable anchor is oriented such that said first and second anchor sections expand in directions transverse to the longitudinal axis of said blood clot filter.

27. The blood clot filter with anchor delivery system of claim 25 wherein said first and second anchor sections when expanded curve arcuately outward from said anchor shaft and back toward the anchor shaft.

28. The blood clot filter with anchor delivery system of claim 18 wherein said expandable anchor, anchor shaft and plurality of elongate spaced legs are formed of thermal shape memory material.

29. A method for positioning and anchoring a blood clot filter having a plurality of elongate spaced legs adapted to expand outwardly from a filter longitudinal axis to bring free ends of said legs into contact with the inner surface of a blood vessel wall having an inner and an outer surface which includes:

enclosing an expandable anchor in a non expanded state within one or more of said elongate spaced legs adjacent to the free end thereof,

causing said elongate spaced legs to collapse toward the longitudinal axis of said filter,

transporting said blood clot filter with the legs collapsed through a blood vessel to a desired position,

causing said elongate spaced legs to expand to bring the free ends thereof into contact with the inner surface of the blood vessel wall, and

subsequently propelling said expandable anchor in the non expanded state out of the free end of the elongated leg and through the blood vessel wall for expansion against the outer side of the blood vessel wall.